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FOOD EXPENDITURE AND NUTRITION IN 1948

OUTLAY ON FOOD AND STRUCTURE OF FAMILIES

In the March number of the BULLETIN we discussed in general the expenditure of the 65 families that supplied to us household accounts in 1948, and we dealt in some detail with their outlay on non-food items. In this paper we shall concern ourselves with their expenditure on food and with the standard of nutrition as reflected in their purchases. In order to be able to compare figures of outlay we shall again frequently make a 'man' value the unit of measurement, this representing the relative cost of maintaining a male adult within the family. The scale of these values for persons in different age and sex groups was given in the first part of this survey, in Table II.

The distribution of the families according to their outlay on food per 'man' in 1948, is shown in Table XVI. Over 46 per cent of the 65 families had a weekly expenditure of between 14s. and 18s., the expenditure of the rest being about equally divided above and below that range.

The figures in Table XVI show that as the number of persons per family declines the average outlay on food increases. This convergence was to be expected; nevertheless we found that a low expenditure on food was by no means always a sign of a low income per head.¹ It is also worth noting that in a group of families of about the same structure it was not generally those with the lowest 'man' value per person—*i.e.*, the families receiving on the average the largest amount of food subsidies, which are distributed per head²—that recorded the lowest expenditure per 'man'.

The outlay on food per 'man' per week of all the families of our sample for 1948, was 15s. 8½d., and their outlay per person was 12s. 4½d. (Table XVII).

¹ The six families with the lowest average expenditure on food consisted of from 4 to 11 persons:

	Food per 'man' per week		Persons per family	Earners
	s.	d.		
(1)	10	7	6	1
(2)	10	10½	11	4
(3)	11	1½	4	2
(4)	11	4½	9	2
(5)	11	5½	4	1
(6)	11	5½	5	1½

The half earner in the last family was the housewife working part time. The husbands in families (3) and (5) held highly skilled and well paid jobs. The husband in family (2) spent per week over 30s. on cigarettes and 7s. 6d. on football pools.

² Small children in receipt of priority milk under the Government scheme at 1½d. a pint per day, actually obtained a higher food subsidy per head than adults.

TABLE XVI
Outlay on Food and Structure of Families

Outlay on Food per 'Man' Range (in shillings)	per Week Average s. d.	Nos. of Families	Persons per Family	'Man' Value per Person
10—12	11 3½	9	6.4	0.73
12—14	13 1½	10	5.4	0.82
14—16	15 0	12	4.6	0.79
16—18	17 2	18	4.1	0.78
18—20	18 6	7	3.9	0.80
20—22	20 8½	4	3.8	0.89
22—24	23 0	3	3.3	0.76
24 and over	26 3	2	4.0	0.81
All Families, 1948	15 8½	65	4.6	0.79
All Families, 1947	15 4½	163	5.0	0.77

The corresponding figures for the 163 families that supplied household accounts in 1947, were 15s. 4½d. and 11s. 9½d. If, however, we only compare the outlay of the 35 unchanged families we find that it was slightly lower in 1948 than in 1947, amounting in 1947, to 15s. 6d. per 'man' and 11s. 11½d. per person, and in 1948, to 15s. per 'man' and 11s. 9½d. per person. The discrepancy in the relative changes in the figures per 'man' and per person is accounted for by the differences in the average 'man' values per person in the two years, the 163 families in 1947 having an average 'man' value of 0.77 and the 65 families in 1948 one of 0.79. The 'man' value per person of the sub-group of unchanged families showed the same increase, from 0.77 to 0.79.

TABLE XVII
Outlay on Food per 'Man' and per Person

Group of Families					Outlay per Week	
					per 'Man'	per Person
					s. d.	s. d.
Unchanged (35)	{ 1947	...	...	...	15 6	11 11½
	1948	...	...	...	15 0	11 9½
All (65)	1948	...	...	...	15 8½	12 4½

FOOD EXPENDITURE IN 1947 AND 1948

For comparing changes in the expenditure on food from 1947 to 1948, the data obtained from the accounts of the unchanged families are more valuable than the figures of average expenditure from the two samples of 163 and 65 families respectively. But when dealing with identical families in two successive years, any change in their expenditure on food is probably assessed more realistically per person than per 'man'. The decrease in the outlay on food per person of these families—1½d. per week—was so small as

to be scarcely significant. But this almost identical expenditure still suggests a distinct fall in the consumption of food, since the Ministry of Labour index showed an average rise in the cost of food, between June 1947, and August–November 1948, by about 7.6 per cent. In Table IV in Part I we saw that the total household expenditure of the unchanged families had risen by approximately $3\frac{1}{2}$ per cent; nothing of this increase had been used to swell the household expenditure on food. On the other hand, there was every indication that the average income of these families had gone up by considerably more than $3\frac{1}{2}$ per cent, and probably more snacks and even main meals, unrecorded in the household accounts, were bought by the earners in 1948 than in 1947.¹

In Diagram D we have set out the data of food expenditure, per person per week, in 1947 and 1948, for the 35 unchanged and 9 changed families. No data of expenditure in 1947 were available for the 21 new families. The justification for considering the outlay of the changed families per person instead of per 'man' is that a person is a more suitable unit than a 'man', for comparing the food expenditure of the much larger group of unchanged families. Since the changed families are easily recognizable in Diagram D little harm is done by treating them as though the differences that occurred in their structure from 1947 to 1946, were negligible. It is obvious that changes in the outlay of these families are less significant than those in the outlay of the unchanged families.

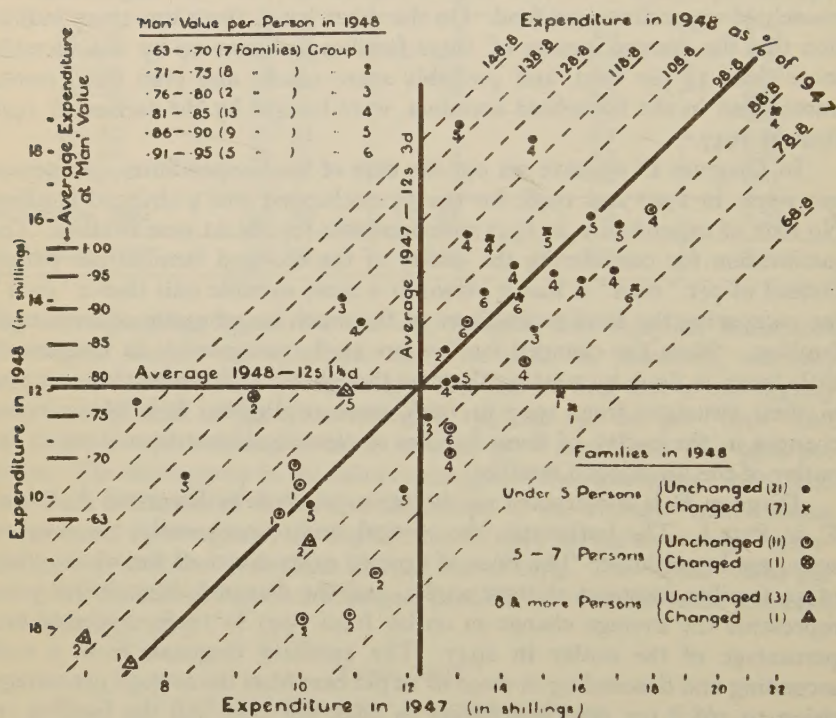
Diagram D is constructed on the same principle as Diagrams A, B, and C, in Part I. The horizontal, the vertical, and, consequently, the diagonal scale, are logarithmic. The lines of average expenditure of the whole group of 44 families intersect at right angles, and the diagonal through this point represents the average change in outlay from 1947 to 1948, expressed as a percentage of the outlay in 1947. The auxiliary diagonals form a scale ascending and descending in steps of 10 per cent from the average percentage, rising to 168.8 per cent and falling to 68.8. per cent. All the families are graded in 6 groups according to their 'man' value per person in 1948, in order to define the relative value of their food expenditure per person. The average 'man' value per person of these 44 families was 0.78 in 1947, and 0.79 in 1948. The vertical inner scale relating to 'man' values indicates where the average line of expenditure per person in 1948, would have to cut the vertical for persons of a 'man' value higher or lower than the average figure of 0.79. Thus the unchanged family of less than 5 persons, in group 6, which in 1948 spent per person per week under 15s.—almost 3s. above the average outlay per person—attained per 'man' only the average outlay on food. This average outlay was also about reached by the three unchanged families consisting of between 5 and 7 persons, in group 1; whose outlay on food per person is shown in Diagram D to have been in the neighbourhood of only 10s. per week.

¹ This seems particularly likely since butcher's meat—the mainstay of most housewives in catering for the earners of their families—was scarcer in 1948 than in 1947. Until mid-June, 1947, the meat ration per head per week was 1s. 4d. worth of meat, and after that, 1s. 2d. In 1948, the ration was cut further, to 1s. worth of meat.

DIAGRAM D

EXPENDITURE ON FOOD IN 1947 & 1948

(Per Person per Week. Logarithmic Scale)



Over half of the 44 families spent on food per person in 1948, between 90 per cent and 110 per cent of their outlay in 1947. This probably constitutes in many households the normal range of variation, since the satisfaction that can be obtained from certain non-food items may compete with that derived from foods that either are, or are considered, non-essentials, and the purchase of the one in preference to the other may depend on season or circumstances. Extreme changes in outlay, amounting to over 25 per cent, only occurred in 4 cases.¹

¹ In 1948, three families spent over 25 per cent more on food per person than in 1947, and one family spent over 25 per cent less. Two of these 4 families were changed families, spending, as families, the same amount on food in 1947 and 1948; but into one of these a child had been born since our previous survey, and of the other a grown up child had gone to live elsewhere. One of the unchanged families that spent much more on food in 1948 than in 1947, had a considerably higher income in 1948.

THE MAIN FOODS PURCHASED

The average expenditure on the main items of food is set out in Table XVIII, which also shows the average quantities bought. These data are given per person per week, which seemed preferable to standardizing them in terms of 'man' values, since most of the rationed foods are distributed per person. There are certain exceptions to this,¹ but no allowance has been made for these in our figures of average consumption in Table XVIII, which simply represent the total weekly purchases divided by the number of persons. In order to obtain the corresponding figures per 'man,' all the figures in Table XVIII for 1947, would have to be multiplied by the reciprocal of 0.77, and those for 1948, by the reciprocal of 0.79.

The foods rationed specifically during 1947 and 1948, were: butcher's meat and corned beef, bacon, eggs, cheese, butter, margarine, cooking fat, sugar, most kinds of jam and marmalade, and tea. Rationed on 'points' were, among other foods, tinned meat and fish, suet, tinned milk, biscuits, and certain cereals. Bread, cake, flour, and nearly all the common cereals, were rationed until August 25th, 1948, and potatoes until May 2nd. Since the rationing of potatoes did not start until November 1947, it left unaffected our samples for the two years. Fresh milk was never strictly rationed, but in general only limited quantities were available for adult consumers.

In 1947, the weekly meat ration during the period of our survey amounted to between 1s. 2d. and 1s. 4d. worth of meat; during the period of our survey in 1948, it was only 1s. worth of it. It will be seen that this decline about corresponds to the average decline on the outlay on all meat, as shown in our figures in Table XVIII, which—including expenditure on unrationed offals and on tinned and cooked meats rationed on 'points'—amounted to 2½d. per person per week. The quantity of all meat consumed declined slightly less than the outlay on it, and when adding together the figures for meat and for sausages we find that the unchanged families purchased on the average the same total amount of these foods in 1948 as in 1947, *viz.*, 18.6 oz. per person per week.

The consumption of milk by the unchanged families was lower in 1948 than in 1947, mainly on account of the smaller number of young children in these families in 1948; but there was also a decline in their purchases of tinned milk, from about 0.3 pint to 0.1 pint per person per week, in terms of fresh milk, apparently owing to conditions of supply. The smaller number of young children also affected the supply of eggs to these families in 1948, as compared with 1947, although the main cause of the lowered consumption

¹ The main exceptions are: meat, tea, and under certain conditions, cheese. Of meat, a child under 5 years old only obtained half a ration, and of tea none. On the other hand, it was entitled to a pint of priority milk a day, at 1½d. a pint, and up to the age of 2 years also to a special allowance of eggs. Children and juveniles between 5 and 18 years could obtain half a pint of milk a day, whatever the milk allowance for adults. Heavy workers and vegetarians had a ration of 12 oz. of cheese a week in lieu of the ordinary ration, which during the period of our survey in 1947 amounted to 2 oz. and during that in 1948 to 1½ oz. In 1948, 8 of the 300 persons covered by our survey, had a special allowance of cheese.

TABLE XVIII. *Consumption of Foods and Nutrition*

Weekly Consumption per Person										Relative Nutritional Value of Foods									
35 Unchanged Families										1947					1948				
1947										All Families (65)		All Families (65)		All Families (65)		All Families (65)		All Families (65)	
Qty.	Outlay	Qty.	Outlay	Qty.	Outlay	Qty.	Outlay	Qty.	Outlay	Calories	Protein	Calories	Protein	Calories	Protein	Calories	Protein	Calories	Protein
s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	%	%	%	%	%	%	%	%	%	%
(1) All Meat ¹	... 15.1 oz.	1 6	13.5 oz.	1 3½	13.6 oz.	1 4½	13.6 oz.	1 4½	13.6 oz.	6.6	9.7	6.5	9.5	6.3	9.2	6.3	9.2	6.3	9.2
(2) Bacon	... 1.9 oz.	3	1.8 oz.	3½	1.9 oz.	3½	1.9 oz.	3½	1.9 oz.	1.2	0.9	1.2	0.9	1.2	0.9	1.2	0.9	1.2	0.9
(3) Sausages	... 3.5 oz.	3½	5.1 oz.	5	4.7 oz.	4½	4.7 oz.	4½	4.7 oz.	1.1	1.7	1.7	2.7	1.5	2.4	1.5	2.4	1.5	2.4
(4) Fish, wet, cured, fried ²	... 5.3 oz.	5½	4.8 oz.	4	5.9 oz.	5	5.9 oz.	5	5.9 oz.	0.7	1.8	0.4	1.1	0.5	1.4	0.5	1.4	0.5	1.4
(5) Eggs, in shell and dried ³	... 1.9 eggs	3	1.3 eggs	3½	1.7 eggs	3½	1.7 eggs	3½	1.7 eggs	0.8	2.1	0.5	1.5	0.7	1.9	0.7	1.9	0.7	1.9
(6) Cheese ⁴	... 2.2 oz.	1	1.8 oz.	1	1.8 oz.	1	1.8 oz.	1	1.8 oz.	1.4	2.7	1.1	2.2	1.1	2.2	1.1	2.2	1.1	2.2
(7) All Milk ⁵	... 4.0 pt.	1 4½	3.6 pt.	1 4½	3.7 pt.	1 4½	3.7 pt.	1 4½	3.7 pt.	7.9	12.6	7.6	12.4	7.5	12.2	7.5	12.2	7.5	12.2
(8) All Fats ⁶	... 7.0 oz.	5½	7.6 oz.	6	7.8 oz.	6½	7.8 oz.	6½	7.8 oz.	8.5	0.1	10.8	0.1	9.6	0.1	9.6	0.1	9.6	0.1
Total (1)-(8)	... 7½	4 7½	4 6½	4 6½	4 6½	4 9	4 6½	4 9	4 6½	28.2	31.6	29.8	30.4	28.4	30.3	28.4	30.3	28.4	30.3
(9) Sugar	... 12.2 oz.	2½	10.1 oz.	3	10.9 oz.	3½	10.9 oz.	3½	10.9 oz.	7.2	—	6.4	—	6.6	—	6.6	—	6.6	—
(10) Jam, Syrup, Honey	... 4.2 oz.	3½	4.9 oz.	4½	5.1 oz.	4½	5.1 oz.	4½	5.1 oz.	1.7	0.1	2.1	0.1	2.1	0.1	2.1	0.1	2.1	0.1
(11) Bread	... 70.4 oz.	11½	69.8 oz.	11½	68.3 oz.	11½	68.3 oz.	11½	68.3 oz.	26.9	33.1	28.4	35.7	26.8	33.7	26.8	33.7	26.8	33.7
(12) Cakes, Buns, Biscuits	... 8.4 oz.	8½	8.7 oz.	9	9.5 oz.	10	9.5 oz.	10	9.5 oz.	5.0	2.8	5.5	3.2	5.8	3.3	5.8	3.3	5.8	3.3
(13) Flour	... 4.7 oz.	1	5.2 oz.	1	5.4 oz.	1½	5.4 oz.	1½	5.4 oz.	2.3	2.7	2.7	3.3	2.8	3.3	2.8	3.3	2.8	3.3
(14) All Cereals ⁷	... 2.9 oz.	2	3.7 oz.	2½	3.4 oz.	2½	3.4 oz.	2½	3.4 oz.	1.6	1.1	2.2	1.7	1.9	1.4	1.9	1.4	1.9	1.4
(15) Potatoes	... 53.7 oz.	7½	52.1 oz.	5½	59.4 oz.	6	59.4 oz.	6	59.4 oz.	4.7	4.6	4.8	4.8	5.3	5.3	4.8	5.3	5.3	5.3
(16) Dried Legumes	... 0.9 oz.	½	0.6 oz.	½	0.6 oz.	½	0.6 oz.	½	0.6 oz.	0.4	0.9	0.3	0.7	0.3	0.7	0.3	0.7	0.3	0.7
Total (9)-(16)	... 3 1	3 1	3 1	3 1	3 1	3 3	3 1	3 3	3 1	49.8	45.3	52.4	49.5	51.6	47.8	51.6	47.8	51.6	47.8
(17) All other food ⁸	... 2½	4 2½	4 1½	4 1½	4 1½	4 4½	4 1½	4 4½	4 1½	22.0	23.1	17.8	20.1	20.0	21.9	20.0	21.9	20.0	21.9
Total (1)-(17)	... 11 11½	11 11½	11 9½	11 9½	11 9½	12 4½	11 9½	12 4½	11 9½	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total Nutritional Intake per Person per Day :										Calories		Protein		Calories		Protein		Calories	
										gm.		gm.		gm.		gm.		gm.	
										2,600		86		2,450		78		2,550	
										81		81		81		81		81	

¹ Including corned beef and other kinds of cooked and tinned meat and offals.² Including eggs from own hens.³ Including milk obtained under the Government scheme for expectant mothers and infants, and all forms of tinned and dried milk, in terms of fresh liquid milk, but excluding all milk obtained by children at school.⁴ Including all special rations and small quantities of cheeses rationed on points.⁵ Rolled oats, ready to eat breakfast cereals, macaroni, semolina, etc.⁶ Rabbits, chicken, tinned fish, fruit and vegetables, tea, coffee, cocoa, fancy foods, meals obtained away from home, etc.⁷ Butter, margarine, cooking fat, suet, dripping.⁸ Excluding tinned fish.

was the seasonal decline in egg production. The consumption of eggs from own hens, which in the early summer of 1947 had amounted to about 0.4 egg per person per week, was practically nil in the autumn of 1948. Of dried eggs, the unchanged families purchased the equivalent of 0.3 shell egg in 1947, and of 0.4 egg in 1948. The sugar ration was 8 oz. per head per week in both years, but more extra sugar for jam making at home was made available during the earlier part of 1947, than during the later part of 1948. Sugar could be obtained in lieu of jam in both years, but of the kinds of jam that were rationed specifically—and only this could be exchanged for sugar—2 oz. per person per week were allowed from August 15th, 1948, while before that date the ration had been 4 oz. The total quantity of butter, margarine, and cooking fat, that could be bought per person per week, was 7 oz. in 1947, and 8 oz. in 1948.

The foods purchased by the families are arranged in Table XVIII in such a way as to distinguish, as far as possible, between those that are sources of animal protein and those that are not. Some foods containing animal protein had to be included in the residual group of 'All other foods', in particular those that formed part of meals bought away from home, as well as rabbits, fowls, and tinned fish, since for all these foods no precise quantitative statements could be obtained, and their nutritional values had to be estimated.

It will be noticed that nearly all the figures of consumption and expenditure in Table XVIII correspond remarkably well to one another. Only the consumption of potatoes of the 35 unchanged families, very nearly the same in both years, fell decidedly short of the average consumption recorded by all the 65 families of our sample for 1948—the remaining 30 families showing a consumption higher by nearly a lb. per head per week than that of the unchanged families. This difference was brought about by the exceptionally high figures of consumption of a few families.

In Table XIX we give figures of average consumption of certain foods not mentioned separately in Table XVIII. Here again, the figures for 1947 and 1948, for the sub-group of unchanged families as well as for all the 65

TABLE XIX
Consumption of Certain Foods

Per Person per Week											
35 Unchanged Families											
All Fams. (65)											
1947											
1948											
1948											
s. d. s. d. s. d.											
Fresh Milk, ordinary ... 2.7 pt. 1 1 2.8 pt. 1 2½ 2.9 pt. 1 2½											
do., Government ¹ ... 1.0 pt. 2 2 0.7 pt. 1½ 0.7 pt. 1½											
Butter ... 2.6 oz. 2½ 2.7 oz. 2½ 2.9 oz. 3											
Fresh Vegetables and Fruit ... — 1 6 — 1 7½ — 1 7½											
Biscuits ... 1.8 oz. 2½ 1.7 oz. 2 1.7 oz. 2											
Cocoa ... 0.2 oz. ½ 0.3 oz. ¾ 0.3 oz. ¾											

¹ i.e., under the Government scheme for children under 5 years old and expectant mothers, at 1½d. a pint.

families, are strikingly similar. The higher outlay on non-priority milk and on cocoa in 1948, was due mainly to rises in prices, the price of milk having gone up by $\frac{1}{2}$ d. a pint and the average price of cocoa bought by the housewives of our samples, by about 2d. a quarter lb.

PRIORITY MILK AND MEALS AWAY FROM HOME

All the children at school could obtain daily one-third of a pint of milk free, but several of the 65 housewives doubted whether their children drank it, or drank it regularly. Two housewives stated that they did not take the cheap priority milk for their children under 5 years old, but both purchased sufficient milk to provide for their infants a pint a day and to allow a satisfactory amount of milk for the remaining members of the family. In three of the families some of the cheap milk obtained for the young children was consumed by other members of the family, and it was not replaced by proprietary milk foods.

As far as we could ascertain the number of main meals bought by the unchanged families per person at work, declined slightly, from 1.6 meals to 1.4 meals a week (Table XX). This suggests a decline steeper than would be

TABLE XX
Main Meals Away from Home

Group of Families		No. of Meals per Week p. Person at Work ¹	per Child at School ²		Av. Price per Meal Bght.	
			Bought	Free	Earners. s. d.	Child d.
Unchanged (35)	{ 1947 ...	1.6	1.5	1.0	1 3 $\frac{1}{2}$	5 $\frac{1}{2}$
	{ 1948 ...	1.4	1.7	0.4	1 4	4 $\frac{1}{2}$
All (65)	1948 ...	1.6	1.5	0.3	1 5 $\frac{1}{2}$	4 $\frac{1}{2}$

¹ A housewife working part-time is counted as half an earner.

² From 5 to 15 years old.

warranted even if we assume that the juveniles in these families who became earners between 1947 and 1948, were all taking packed meals. However, in a number of cases the housewives stated that the earners of their families were purchasing some main meals away from home, but that they did not do it regularly and always also took sandwiches. Unless in such instances the housewives were able to give at least approximately the number of meals bought during the period under survey, no allowance for meals eaten away from home could be made.¹

THE NUTRITIONAL INTAKE

In order to be able to assess the nutritional intake from the foods bought by the housewives during the periods surveyed by us, we have expressed the nutritional requirements of the families in terms of Male Adult Equivalents, MAE for short. The scales used are set out in Table XXI. By applying

¹ How many of such occasional meals were bought by a particular earner depended probably on three main factors: the quality of the sandwiches packed by the housewife; the meal offered at any particular day at the eating place frequented by the earner; and the amount of money in his pocket.

TABLE XXI
Nutritional Requirements

Absolute Requirements per Day					Calories	Protein gm. 70
Male, 21 years and over	...	...	...	...		
					3000	
Relative Requirements					Calories	Protein
Male, 21 years and over	...	...	...	...		
Female, 21 years and over	...	...	...	...	1.00	1.00
Juveniles and Children :	...	...	...	...	0.83	0.86
17 years—21 years ...	...	...	...	...	1.00	1.29
15 years—17 years ...	...	...	...	...	1.00	1.43
12 years—15 years ...	...	...	...	...	0.97	1.36
7 years—12 years ...	...	...	...	...	0.70	0.93
3 years—7 years ...	...	...	...	...	0.50	0.71
1 year—3 years ...	...	...	...	...	0.37	0.60
6 months—12 months	...	...	...	...	0.27	0.33
under 6 months ...	...	...	...	...	0.20	0.27

them we found that the foods purchased by the unchanged families in 1947, yielded about 3,300 calories, 38 grammes of first class and 52 grammes of second class protein, per MAE per day, while in 1948, the average values amounted to only 3,000 calories, 32 grammes of first class and 48 grammes of second class protein (Table XXII). For all the 65 families of our sample for 1948, the figures of nutritional intake per MAE per day were: 3,150 calories, 35 grammes of first class and 50 grammes of second class protein.

TABLE XXII
Nutritional Intake

Group of Families		Per Male Adult Equivalent per Day			Protein (gm.)	
		Calories			total	animal
Unchanged (35)	{ 1947	...	...	3300	90	38
	{ 1948	...	...	3000	80	32
	1948	...	...	3150	85	35
All (65)						

In Table XVII we saw that the outlay on food of the unchanged families declined from 15s. 6d. per 'man' per week in 1947, to 15s. in 1948. During about the same period—from July 1947 to August—November 1948—the Ministry of Labour index showed a rise in the cost of food by approximately $7\frac{1}{2}$ per cent. On the basis of these figures one would therefore expect a decline in the domestic consumption of food by the unchanged families, by about 10 per cent. Our figures of nutritional intake come in fact very close to this, in particular if we do not distinguish between first-class and second-class protein, the intake of the latter having fallen by less and that of the former by more than 10 per cent.

CONCLUSION

Our survey of expenditure on food in 1947 and 1948, suggests that the amount allotted to food does not represent a fixed proportion of the house-keeping money of individual families, but varies according to the expenditure on non-food items. The supply of these items was more plentiful in 1948, and the outlay on them by the families of our sample was higher than it had been in 1947.

Some important foods supplying first-class protein were scarcer in 1948 than in 1947; on the other hand, the fat ration was raised by over 14 per cent and the actual consumption of fats by the families of our sample increased by about 10 per cent. Not all the housewives availed themselves of the supply of cheap milk for children under 5 years old, and not all the housewives who did buy this milk used it only for these children. During the period between our surveys in 1947 and 1948, the Ministry of Labour index showed a rise in the cost of food by about $7\frac{1}{2}$ per cent, and approximately the same average rise in cost was revealed in the household accounts submitted to us.

T. SCHULZ.

ELASTICITY OF DEMAND FOR U.K. IMPORTS

The price and income elasticities of demand for imports in the inter-war period are of interest both as historical facts and because they may be used for making post-war forecasts of the balance of trade. It is the purpose of this article to enquire into the size of these elasticities and into the reliability of estimates made of them.

The principal estimates of the pre-war U.K. elasticities of demand for imports are those of Tse Chun Chang. The equations which he obtains are :

$$\begin{array}{llll} \log X_1 = & + 1.43 \log X_2 - 0.64 \log X_3 & 1 \\ \log X_1 = & + 1.10 \log X_2 - 0.28 \log X_3 + 0.25 \log X_4 & 2 \\ \log X_1 = & + 1.41 \log X_2 - 0.46 \log X_3 & 3 \end{array}$$

where X_1 , X_2 , X_3 , and X_4 represent, respectively, Import Volumes, Home Employment, Import Prices, and Export Volumes, the coefficients being the elasticities of demand for Imports.

Chang uses partial regression analysis, working with the logarithms of the deviations from straight-line trends of the indices of import prices and volumes, and of the figures of insured employed given in the *Statistical Abstract*. The figures are annual, covering the years 1924-1938. The index of import prices is corrected in accordance with variations in Inland Revenue receipts from tariff payments, and is then divided by the Ministry of Labour Cost of Living Index, to allow for variations in the prices of home-produced substitutes for imports. The third equation is obtained by excluding from the first regression calculation the data for 1926 and 1931, on the grounds of abnormal relationships in these years between import volumes and the level of home employment. The second equation results from the inclusion in the third equation of the additional variable, the volume of exports.

Following, with minor emendations, the methods used by Chang for his first equation, but substituting for home employment data of real national income, another estimate of the elasticities of demand may be obtained. Chang discards national income in favour of employment data on the grounds that the latter more faithfully reflect short-term (=quarterly) variations in 'economic conditions'. He gives no reason for preferring to use employment data for calculations based on annual figures. The correlation index between the logarithms of the deviations of the two variables from their respective linear trends is +0.8. It remains very doubtful, however, whether changes in the numbers of insured employed may properly be substituted for changes in real national income in the estimating equation. Variations in the numbers of insured employed do not reflect changes in the number of hours worked nor in hourly productivity. Further, 50 per cent of those available for paid employment are not included in the figures. Variations in their employment, their hours of work and their productivity also cannot be reflected. Only if changes in the numbers of insured employed bore a constant ratio to changes in all the other factors enumerated, could the

¹ *Economic Journal*, 1946. ² *Review of Economic Studies* 1945-47 and *Economic Journal* 1946 (December), and *Review of Economics and Statistics* (May 1948).

³ *Economic Journal*, 1947.

former truly represent changes in Real National Income. The scatter diagram (Diagram I) shows the relationship between the logarithms of index numbers of Insured Employed and of Real National Income.¹ It is clear from this Diagram that the ratio between the two variables was not constant throughout the period 1924-1938.

The substitution of Real Income figures¹ results in an apparent income elasticity of $+0.7$ and an apparent relative-price elasticity of $+0.1$. The range of error is such that the positive sign before the price coefficient has little intrinsic importance. Lower elasticities for both income and prices are, however, indicated, and a further examination of the relative merits of the various estimates is required before any conclusion can be reached.

To obtain his second equation Chang employs an additional independent variable, the volume of exports, because of the high import content of British exports. Unfortunately there is a high positive correlation between the volume of exports and real national income, the percentage fluctuations of the former being greater than those of the latter. When the new variable is held constant, therefore, the variation in import volumes remaining to be accounted for is not as great as is properly attributable to the other independent variables. Substituting in Chang's second equation² real income data³ in place of employment data, an equation is obtained which shows the distorting effects of including export volumes in the calculations. The apparent elasticities become -0.4 , -0.4 , and $+0.4$, for Real Income, relative prices, and export volumes respectively. The price elasticity is fortuitously acceptable. The income elasticity, however, is an impossible one, and it seems preferable to omit the additional variable.

By his exclusion of the data for 1926 and 1931 in calculating his second and third equations Chang raises the important question of the homogeneity of the period 1924-1938. In the article in the *Economic Journal* 1946, Chang gives a diagram of the regression of import volumes on home employment, showing a marked degree of scatter about the fitted line. This suggests a lack of homogeneity in the period 1924-1938, for which the exclusion of the data for 1926 and 1931 (in which years the two variables moved in contrary directions), is an inadequate remedy. The most evident general cause of heterogeneity in this period is the introduction of protection, which resulted in a fall in the marginal propensity to import. Chang's corrected import price index⁴ allows for this. It is not practicable, however, to allow for other possible sources of heterogeneity, such as changes in the percentage distribution of income increments between imports and home-produced goods,⁵ for example, or changes in the percentage composition of total retained imports. Consideration of the secular trend lines which may be fitted to the

¹ A. R. Prest, *Economic Journal*, March 1948. Money income figures given there, deflated by the Cost of Living Index.

² But including the data for 1926 and 1931.

³ Prest's figures, deflated by the Cost of Living Index.

⁴ See page 109.

⁵ Changes in the structure of industry, or in the marginal propensity to consume, might result in a different distribution.

data lends some support to the view that the period is not an homogeneous one. Chang fits straight line trends to each of his variables. In a period of such violent fluctuations of economic activity, however, it is not to be expected that these straight line trends should be economically significant. For the six years 1924-29 the average annual rate of increase of the index of Real Income¹ is 2.8 per cent; while for the years 1932-37 the rate is 4.2 per cent. The average annual rate of increase of the index of Import Volumes also differs between the two six-year periods, although not so markedly, owing to the impact of protection on Import Volumes. The Import Price index (whether corrected or uncorrected for tariff changes), actually falls during the first period and rises in the second. There is also no appearance of constant rates of acceleration or deceleration in the changes of the variables, as would be required by second degree trend lines. It seems clear therefore that secular trend lines cannot be deduced from the data for the fifteen years under consideration, during which violent short-term fluctuation of total economic activity was dominant. Chang's method of estimating the relationships between deviations of the variables from fitted trend lines covering these fifteen years seems therefore of very doubtful economic significance.

Instead of following this method, the period considered may be restricted to the years following the depression, as follows.

The data employed are quarterly: the Board of Trade index number of the volume of retained imports; an index number of Colin Clark's figures of Real National Income,² and the Board of Trade index number of the prices of retained imports, divided by a price index of goods produced and consumed at home, derived from Colin Clark's separate price series.³ The last quarter for which Colin Clark's separate price indices are given is 1936 I. Correction of the import price index for tariff effects is impossible with quarterly data. The period covered is therefore 1932 IV-1936 I, which period, it seems reasonable to assume, is homogeneous in all essential respects, although unfortunately very short.

Correction for seasonal variation in the three series was made by the use of moving averages, and the calculation was based on the logarithms of the link relatives, on the assumption of linear relationships. There was no evidence of a time-lag between the level of income and the associated volume of imports, and the lag was therefore assumed to be zero.⁴

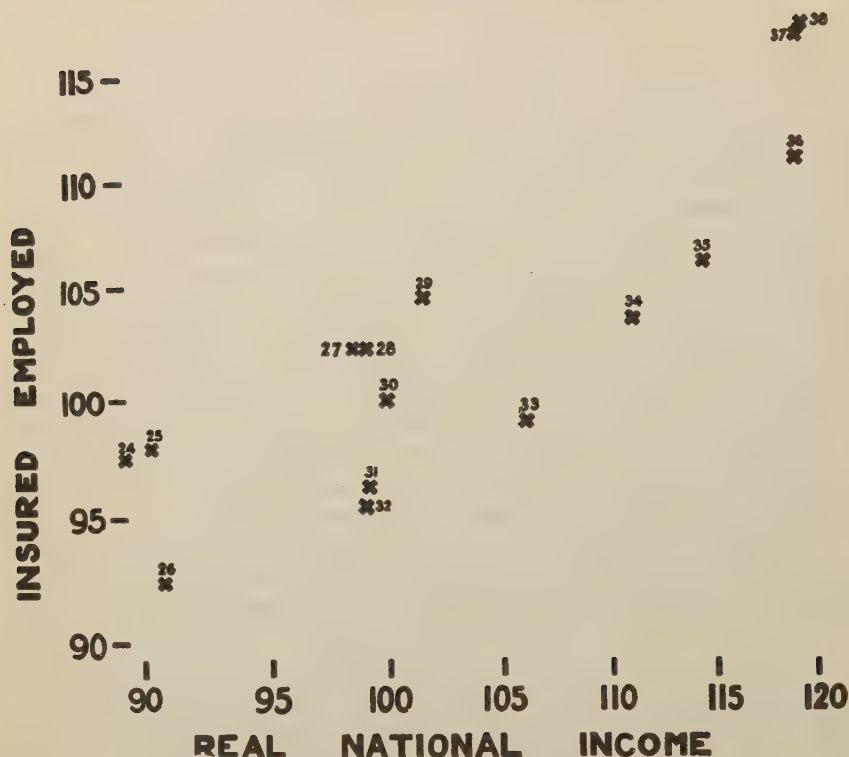
¹ Prest's figures, deflated, as above.

² *Economic Journal*, 1938. These figures are preferred to Prest's, deflated by the Cost of Living Index, as they are obtained by averaging independent estimates of the National Income and the National Output, the data being deflated by specially constructed price indices of the principal components of the National Income. The Cost of Living Index is clearly not representative of the average changes in the price-level of all goods and services.

³ *National Income and Outlay*. The scope of the Cost of Living Index renders it unsuitable to represent the price-level of home-produced substitutes. Comparison of the above index with the Cost of Living index shows marked differences in both the direction and extent of their changes. Cf. Diagram II.

⁴ Chang estimates that there is a time-lag of one to two quarters between changes in employment and the corresponding changes in import volumes. His pairing of data for identical annual periods is therefore approximate only.

DIAGRAM I. Logarithms of indices of Insured Employed, and of Real National Income.* (1930=100)



* Prest's figures deflated by the Cost of Living Index.

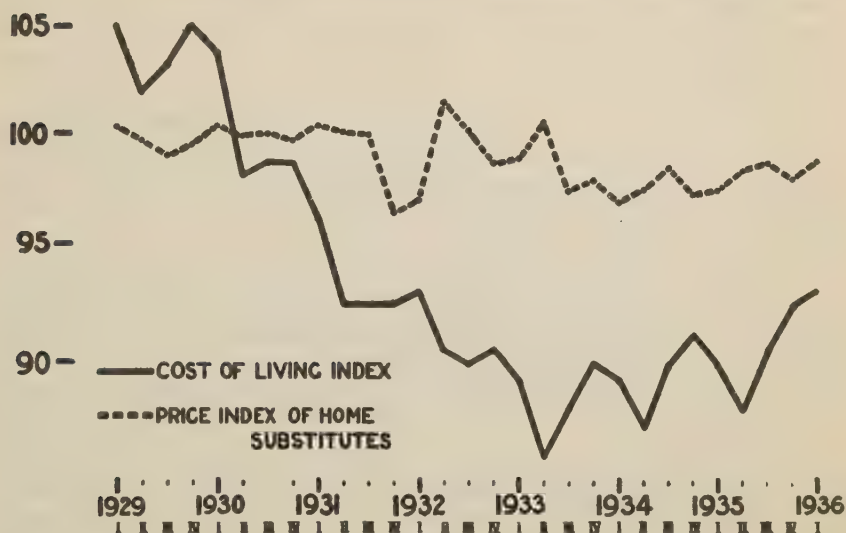
The equation obtained is :—

$$\log X_1 = 0.005 + 1.2 \log X_2 + 0.23 \log X_3$$

where X_1 , X_2 , and X_3 refer respectively to Import Volumes, Real National Income and Relative Import Prices.

It is of interest to substitute quarterly employment data for Real National Income in this calculation. The employment and relative price elasticities then obtained are + 0.79 and + 0.22 respectively. It is to be expected that the income and employment elasticities should differ from each other. It may be seen from Diagram I that the similarity of the price coefficients is also to be expected, in contrast with their difference in the estimates for the whole period 1924-1938. From 1931-1936 the points on the Diagram lie approximately on a straight line, indicating a constant relationship between the percentage changes of real income and insured employment. If Colin Clark's figures of Real National Income for 1929-1937 are substituted for Prest's, deflated by the Cost of Living Index, the straight-line relationship is

DIAGRAM II. Logarithms of indices of the cost of living and of the prices of home-produced substitutes for Imports.* (1930=100)



* *i.e.* all goods which were both produced and consumed in the U.K. Index formed from price indices for Consumption, Investment, Export and Import Goods, given by Colin Clark, 'National Income and Outlay'. Weighting derived from approximate 1930 values.

extended to 1937, while the points for the years before 1931 still lie above the line as in the Diagram. For the period 1924-1938 the relationship between the percentage changes of the two variables was apparently not a constant one, and it is to be expected that the elimination of the income and employment effects respectively should result in different estimates of the price elasticity.

It seems absurd that the calculated price elasticities for 1932-1936 are of positive sign, but the range of error is considerable. In view of the small number of observations, estimated elasticities of this size are fully compatible with 'true' elasticities as high as -0.3^1 (10 per cent probability), even on the assumption that the variables are randomly distributed. The calculation of von Neumann's ratio³ shows, however, that the distribution of the dependent variable is not random, despite the use of first differences.³ This may be partly due to specific causes,² but is probably due principally to the attempt to eliminate seasonal fluctuations by a moving average. The lack of randomness increases the range of probable error, and consequently the unreliability of the estimates still further.

¹ Or, for that matter, as 'low' as $+0.7$.

² Such as 'the later arrival of last year's crop,' noted by the Board of Trade Journal with reference to the unusually large imports of raw cotton in the last quarter of 1935.

³ See the article by R. Stone, Review of the International Statistical Institute, Vol. 16, No. 1/4. Cf. also P. Ady, the Institute's Bulletin, December, 1949.

An attempt to choose between the estimates made must rest largely upon the considerations of method discussed above. Of Chang's estimates either those of his first equation or those of his third equation seem preferable. Were the period an homogeneous one the estimate covering the period 1924-1938, and using real income data, would appear more satisfactory than these estimates of Chang. Since homogeneity does not appear probable, the estimates for 1932-1936 may be preferred. The relative-price elasticities obtained from the 1924-1938 calculation, and from the 1932-1936 calculation are similar, while the income elasticities differ markedly. The 'true' price elasticity is probably low but of negative sign, and an income elasticity in the neighbourhood of unity is suggested.¹

More important than the derivation of actual figures for these elasticities, however, is the appreciation of the degree of uncertainty which attaches to their estimation. The unexpectedly positive price elasticities which may be obtained by methodologically justifiable emendations of Chang's methods emphasise the fact that any estimate of these elasticities is little more than an elaborate guess.

It may be added that the use of these estimates for making forecasts in the post-war period involves important assumptions. Firstly, if the method of estimating the elasticities includes the elimination of secular trends, it must be assumed that no such trends are currently present. Secondly, it must be assumed that the pre-war and post-war samples are drawn from the same population, implying no effect on the elasticities from post-war trade restrictions, and from the economic changes which give rise to these restrictions.

F. G. THACKERAY.

¹ Similar estimates are obtained by Chang's amended methods, (excluding 1926 and 1931 and including the volume of exports) ; but an assessment of the methods employed by Chang does not justify the acceptance of these estimates on their own merits. In an article in the *Economic Journal*, June 1949, Colin Clark uses Chang's estimate of the relative-price elasticity, -0.64 , a figure perhaps much larger than the 'true' elasticity.

CORPORATE TAXATION AND DEPRECIATION

The following thoughts on the relation of depreciation allowances to corporate taxation were inspired by a visit to Sweden, Switzerland and Belgium in summer 1948. The visit was primarily for research into productivity, and it was financed by the National Institute for Economic and Social Research, to whose generosity I am therefore chiefly indebted for the information on which this article is based. The connection of productivity with corporate taxation is obviously very close.

The general problem, if any economist is still unfamiliar with it, is how to define corporate income for the purpose of corporate income tax. Payments for a fixed asset are clearly a cost not imputable to one year alone, and net revenue for several years is rightly counted after some deduction under this head. But over how many years may the payment be spread? And what payment is in fact to be spread? The historical cost of the asset or its replacement cost, or some other? And which fixed assets really are costs of production, and which merely tax-free outlets for net profits, or net investment by the firm? We shall see here how the British answers to these questions compare with the Swedish, Swiss and Belgian. We shall also criticise these answers.

We first consider the rates of depreciation allowed tax free, *assuming prices constant*: that is the period over which a given fixed asset may be depreciated tax free. But before proceeding to a description it is well to note some theoretical aspects of the matter. First, it is now widely understood that these allowances have a vital influence on investment, and therefore on productivity. Generous amortisation rates are a great advantage to a firm, for the more it can charge to profits in the first year the less it has to borrow, with attendant interest charges and administrative expenses. Further as the redemption period is shorter it will be able to borrow what it must borrow on easier terms. Best of all the psychological burden of uncertainty—a burden apt to be assumed by both borrower and lender—is lightened. Changes in these allowances are vastly more important for investment than changes in the rate of interest.

The Treasury on the other hand loses nothing by allowing larger rates. In the normal case the capital is merely written off more quickly, the state receiving less tax during this period and more tax thereafter. It might, however, be thought that the Treasury loses if a firm, by alleging high depreciation costs, actually makes a loss, and is allowed by the regulations to set that loss off against next year's profits. But a trivial algebraical example will show that this fear is entirely groundless. Let a firm buy a piece of equipment lasting $(m + n)$ years, and let its gross profit be $\pounds x$ for each of these years, and the rate of corporation tax be l . Under fiscal system A it is allowed to write the equipment off in m years, at a rate which entails a yearly sum

$\pounds(x + p)$, where $p < \frac{xn}{m}$ (we shall see why this must be so in a moment). The value of the equipment is thus $\pounds m(x + p)$. Then the firm makes a loss of

$\pounds p$ for m years and a net profit of $\pounds x$ for n years. The latter is taxed, *but there is no rebate from the Treasury for the loss*. Total tax paid = $\pounds nlx$. Under fiscal system B the equipment must not be written off until the $(m + n)$ th year, and the rate of depreciation therefore entails a yearly sum of $\pounds(x + p) \frac{m}{n+m}$ where, be it borne in mind, $p < \frac{nx}{m}$, so that the whole $< x$.

A net profit of $\pounds \frac{nx - mp}{m+n}$ is made each year, and is taxed each year, yielding $\pounds l(nx - pm)$ in all. But this is smaller than the yield under system A, by an amount pml . Even supposing under system A losses in one year can be written off against profits in the next, the yield is still likely to be greater. For each year's loss that can be thus transferred to a profitable year, $\pounds p$ is deducted from the profits, and $\pounds p$ from the tax. So unless all the m years of loss are set off the fisc is bound to gain by system A, and it can in no circumstances lose. Nor would system A yield less than system B if in the m th year the firm promptly replaced its equipment. For under system B it would then be entitled to write off the outstanding book value as obsolescence allowance, which is also tax free. Only if the large amount of the obsolescence allowance caused the firm to make a loss that year would system B yield more, for it would turn out to have taxed on previous years' profits that had not really been earned.

The Swedish¹ amortisation rates show a firm grasp of this point. In general the firm may use what rates it likes, even to the extent of writing off machine tools in one year only—a provision so 'generous' and unusual that at first one suspects a catch. But there is no catch, and no disadvantages occur in practice as a result of this well-known curiosity among taxation laws. It must have largely contributed to the high level of Swedish productivity. The Belgian rates, typically of the country, cannot be laid down as a fixed schedule at all. Amortisation is fixed by agreement between each individual firm and the Treasury, and particular circumstances bulk so large that all authorities approached refused to generalise about the rates allowed. The system is thus at once highly bureaucratic and extremely flexible—no unusual combination in Belgium! The Swiss system closely resembles our own and is on the whole not more generous, thus :

TABLE. Rates of Depreciation on Book Value

	Switzerland (Federal Wehrsteuer, 1943)	U.K. (Income Tax, 1948)
	%	%
Factory Buildings (rate on original cost)	1—2	2
Water and electric leads and piping, private rail tracks...	5—10	4—6
Office and shop furniture	10—15	6
Production and power machinery	15—20	9½—12½
All non-motor transport	15—20	25
Motor transport	20—25	25
Special machines, e.g. in quarrying and chemicals ...	20—25	9½—12½

¹ Losses cannot in fact be carried forward and set off against next year's profits in Sweden, and the system is in this respect less generous than ours.

On the other hand our law now gives a 40 per cent initial allowance, i.e. allows 40 per cent¹ of the original cost to be written off in the first year, whatever the normal rate of depreciation. This goes some way towards the beauty of the Swedish system, and is an improvement on the other two. The initial allowance has been described as a tax free loan to industry by the Exchequer.²

The following items are not allowed as costs by the British tax law :

(a) Depreciation on office and canteen buildings, shops, hotel buildings, certain types of warehouse;

(b) Depreciation on wasting assets.³

Most of these are allowed as costs by each of the other three tax systems, and thus have not to be paid for out of taxed profits. But illogical and unfair as the British system is here, it is well to point out that excessive generosity is equally bad—indeed in hard times it is worse. The Swedish law allows almost anything as cost, or—as in the case of canteen buildings—as half a cost. It also allows depreciation of stocks to well below their replacement cost—a practice that began in the 1920's when violent price falls were commonly expected and firms naturally wished to safeguard themselves against book losses, but which would seem to have no economic significance whatever to-day. This laxity has several evil consequences. It leads to much unjustified expenditure by corporations on luxury offices and—dare we say it—luxury welfare services. Much of this welfare money would be at least more equally and fairly spent by the state, though doubtless not with such variety, enterprise and taste. As it is the large profitable concerns compete with and far out-do the social-democratic state in their social services; and the streamlined luxury of their office buildings often reminds one of a Hollywood screen set. But of course the poorer companies, and those whose management happens to be otherwise interested, do nothing, thus causing a very unequal distribution of the good things of life from firm to firm. Another disadvantage of this system is that it encourages the spending of profits in periods of inflation—when of course profits are large; and at that not on productive investment but on precisely the sort of luxury consumption that should be curtailed in such periods. Again stocks have been bought up before now by Swedish firms merely in order to be written off, thus providing a tax free outlet for profits.⁴ The whole system leads to a great deal of irresponsibility,⁵ and is probably in no small measure to blame for the excessive paternalism of the big firms, and for to-day's inflation and bottlenecks.

It is probable (summer 1948) that the Swedish authorities will reform the corporation tax. They would do well to distinguish between the excellent

¹ 10 per cent in the case of factory buildings.

² *Economist*, June 25th, 1949.

³ But this position will be greatly modified from 1949 onwards. See *Economist*, July 16th, 1949, p. 158.

⁴ For any *extra* stocks bought up entail an *addition* to the stock depreciation fund.

⁵ 'That's all right, Wigforss pays half' is the common attitude of management to such expenditures. (Herr Wigforss was the dogmatic socialist Minister of Finance—a highly unpopular figure in business circles).

provision as to *rates of amortisation* and the far too inclusive lists of *objects allowed to be amortised*, or indeed treated as current costs.

But suppose prices are not stable? Suppose the machine costs double, or one half, its original cost to replace? Should net income be calculated after setting aside replacement cost or original cost? It so happened that the century which saw the invention of income tax was the first—and evidently also the last—to experience stable prices. This question therefore did not arise. Besides, accountants are lawyers before they are economists, and the legal obligation was not to keep the machinery but the proprietors' money capital intact. 'Mark gleich mark': small fluctuations in prices did not upset the proprietors as large ones would have, and income tax law took no notice of the problem. But when large fluctuations occur 'mark gleich mark' is an absurd policy from *both* points of view. The proprietors are cheated (or receive a windfall) if they get back their money, and the going concern under- or over-replaces its machinery free of tax.

It is especially rises in replacement cost that present a very serious problem, which has by now acquired a small economic literature to which the reader is referred.¹ The British, Swedish and Swiss systems make no allowance for this, so that if a firm wishes, as it clearly should, to provide a depreciation fund equal to replacement cost it must make up the difference out of the *taxed* profits. In Belgium, where the value of money has fallen so much and so fast as to necessitate a whole series of legal provisions in favour of creditors, a special once-for-all provision has been allowed also in respect of depreciation funds. A pre-war base date was fixed: the disposal value at that date was taken for all machines and industrial or commercial buildings still in use five years later: it was multiplied by $2\frac{1}{2}$ and amortisation was allowed on this new book value. For all assets subsequently acquired no change in book values was allowed. A similar procedure was adopted in 1926, the year of the 'save the franc' crisis.

As an imitation of this procedure is now being urged upon the British Treasury it is as well to examine it carefully. A once-for-all allowance of this kind, it is claimed, imposes less mental readjustment and intellectual strain upon accountants. But it also requires political pressure to bring it in every time it is needed, while an automatic and permanent scheme is in this respect once for all. Again by a natural law of fisci, which certainly governs the British Treasury as much as the Belgian, the factor $2\frac{1}{2}$ was palpably too small. It should have been more like 4. Further, prices have risen since the allowance was made. Yet again the scheme suffers from the disadvantage of

¹ *Times*, 23 and 24 March, 1949.

Economist, 12 June, 1948. 'What are Profits?'

Chambers, *Lloyds Bank Review*, January 1949.

Little, *Accounting Research*, November, 1948

Sanders, *Accounting Research*, July 1949.

Norris, *Accounting Research*, July 1949.

(*Accounting Research* is a new quarterly published by the Cambridge University Press).

Kristensson, *Economic Journal* (Historical Supplement), 1940.

Froehlich, *American Economic Review*, March 1948, pp. 86-91.

capital levies and all once-for-all taxes and rebates; it is unfamiliar, puts a great strain on administrators and is peculiarly open to abuse. There is surely no doubt that a permanent and automatic scheme, if a feasible one could be found, would be better.

The obvious answer is to base depreciation on the replacement cost of the plant, and it is about this proposal that controversy rages. Some versions of such a scheme are clearly impossible. Current replacement cost cannot be worked out every year, especially not in the majority of years in which no replacement is intended. The labour involved would be too great, and the values would be mere guesswork. Again, if techniques change the old type of assets will no longer be being produced: there will be no current replacement cost. What then is the accountant to do? The new type of machine may be on an altogether larger scale, so that some fraction of its value would appear to be the relevant magnitude. Or there may be no new type of machine—the whole industry may have folded up, leaving no criterion of replacement cost at all. It is not then surprising that accountants generally are hostile to this sort of proposal, despite the greater profits their firms would earn as prices rose.

I shall suggest here a solution, based on the replacement cost idea, that appears to obviate all these difficulties. But let it be said first that it is not here intended to suggest changes in accounting procedure, which are a legal and technical matter, but in taxation incidence. I do not pretend to know how accounts should be presented to shareholders, or whether depreciation funds beyond original cost should be called a provision or a reserve or simply depreciation funds, or what effect the importation of these extra allocations into the appropriation account should have upon the book value of the plant shown in the balance sheet. Economists have intervened in this controversy because our present income tax taxes replacement, which is clearly wrong. For (1) it distorts the pattern of investment in favour of new firms, of firms which bought plant at periods of high prices, and of firms which spend more on repairs than on replacements; yet there is no logical reason why such enterprises should be favoured. (2) It drives businessmen to outside finance,¹ which involves the nation in the perfectly real costs of obtaining such finance; for borrowing is much more expensive of administration than ploughing back. (3) The psychological costs of such borrowing choke off some investments altogether. These bad effects of taxation are logically separable from the finer points of accountancy. If necessary separate books should be kept for income tax purposes, so that the only effect on the ordinary accounts is that a different tax bill is entered in them.

Again before we turn to the reform itself, we want to be quite clear about what is being reformed. The suggestion is not of a *lower* tax on business, but of a more equitable one: the reform could be accompanied by a higher tax on all profits, or one designed to extract the same amount of money in

¹ Of course inflation as such makes inside finance easier, but the tax inequity makes it more difficult for some firms than for others.

toto. Nor is it denied that the effect of inflation, which itself necessitates the reform, is to encourage investment. I am not suggesting any particular change in the volume of investment, but a more rational distribution of investment, an allocation of scarce resources between competing ends more in accordance with social and economic priorities. Thus the curious tendency of left wing economists to oppose these proposals is irrational. We are not asked to pity the poor capitalist, but to arrange that two capitalists with the same replacement costs and the same real profit should pay the same tax, rather than basing the tax on irrelevant differences in original cost. This would have been desirable even under Lenin's New Economic Policy, or any other anti-capitalist régime. Nor does it matter that the value of a wisely invested depreciation fund rises *pari passu* with an inflation. For instance if a machine costs £100 and £10 is set aside each year, by the time inflation has raised replacement cost to £150 the first £10 will be worth £15. This is very true, and an important mitigation of the *absolute* hardship of the firm that bought at £100.¹ But the *relative* hardship, compared, let us say, with a firm that bought at £130, remains unaffected. For the first firm may only set aside £10 a year tax free, while the second may set aside £13; and the value of these £13 is also enhanced by inflation. Our reform is not directed to preserving the value of depreciation funds from the ravages of inflation, but to removing a tax inequity. Nor of course is there any objection to a tax on business profits as such.

Now for the reform itself. My suggestion is that original cost should be currently multiplied by a general price index, to save the trouble of individual valuations. Mr. Chambers (*loc cit.*) appears to think there is no half-way house between amortisation based on original (or book) value and amortisation based on *expected* replacement cost at date of replacement. He rightly condemns the latter as involving much mere guesswork. The intermediate system is best explained algebraically. Let amortisation be conducted on straight line principles at $R\%$ of original cost per annum, for simplicity. Let C be original cost and $P_1, P_2, P_3 \dots$ the price index in years 1, 2, 3 . . . Then at the end of year 1 the depreciation fund should stand at RCP_1 , at the end of year 2 at $2RCP_2$, at the end of year 3 at $3RCP_3$, and so on. And the amounts to be set aside are clearly $RCP_1, 2RCP_2 - RCP_1, 3RCP_3 - 2RCP_2$ and so on. In a bad year the price index may fall so drastically that $nRCP_n - (n-1)RCP_{(n-1)}$ is a negative quantity. In that case this quantity should be transferred from the depreciation fund to the profits, where it will of course be taxed. This will have a deflationary effect, as Mr. Chambers points out, when it is least required. But the effect is not a serious one and can in any case be obviated by legislation, providing that no such windfalls be taxed.

It may be asked, why a general price index and not one for capital goods alone? The reason is hinted at by Mr. Little (*loc. cit.*, p. 62).² For the

¹ But the £10s they set aside in subsequent years will not rise so far as £15.

² But I regret I am completely unable to understand the arguments (pp. 74-76) which lead Mr. Little to reject replacement cost as a basis for amortisation. Further they would appear all to apply with equal force to his own solution (a general once-for-all write up)—a solution for which furthermore he adduces no single favourable argument in the text.

capital goods index may rise more than the general index, and this will increase the social opportunity cost of the investment over that which it had when it was made. The tax law should not be so devised as to conceal this from the entrepreneur, but should return him his investment in equivalent generalised purchasing power. He may better serve the public by substituting labour or raw materials for capital in the new situation.

So much for the removal of the tax inequity. But what else would be achieved by the introduction of such a reform? We have already seen that it would have slight inflationary effects in booms and deflationary effects in slumps. For their tendency is to divert money from depreciation funds to taxation and distributable profits in the latter case, and *vice versa* in the former; and the propensity to spend out of taxation and distributable profits is less than the propensity to spend amounts set aside for depreciation *even in years when replacements are not being made*. For depreciation funds are normally invested in the working capital of the business until required. But this slight disadvantage can be legislated against, at least in the more important case of deflation, by the exemption of surpluses accruing in the depreciation fund from taxation or from treatment as distributable profit. On the other hand, when the fund is invested in outside securities and not in the working capital of the business the whole question does not arise.

However we are more likely to encounter inflation than deflation in the future: would not the reform tend in other ways to aggravate this? It appears that this is undoubtedly so: the very general encouragement of investment it would give is probably inflationary. Further, although the taxation of gross profit as net profit in clearly wrong, the state must balance its budget somehow—and at least in our present kind of inflation this is no easy matter. The simple answer to both these objections is to raise the profits tax or the standard rate of income tax, so as to obtain the same total sum as before.

On the quantity distributed in dividends the reforms would work in two ways. First, the total tax paid out of gross profits would fall (in inflationary circumstances), and this might encourage distribution; for it would be less necessary to set aside reserves out of taxed funds. But secondly the very many business men who unthinkingly distribute their capital as income would be checked, for the new allowances would bring home to them the true facts about depreciation. If the first tendency outweighed the second dividends could of course be more heavily taxed than at present, so that in any case there is no objection here to the reform on the strength of increased dividends.

Again it may be noted that the burden of fixed indebtedness varies with the value of money so as partially to offset the increased or diminished burden of depreciation. If the latter were reformed falling and rising prices would vary the former without offset. But this is really a separate problem, and should be treated as such.

Some once-for-all revaluation on Belgian lines would doubtless be necessary before introducing a scheme such as that suggested above, in order to clear up retrospectively the losses already suffered by depreciation funds; but that is the most that can be said for it.

Further, investment out of amortisation funds is more difficult to control than investment through borrowing. It would certainly be a renunciation of power by the state to ease the tax allowances, unless, as suggested above, it imposed heavier profits and income taxes in compensation. Opinion will doubtless divide here on the usual lines. But we should bear in mind that borrowing creates a rentier class, while ploughing back profits is to be encouraged as one of the great contributions to the euthanasia of the rentier (except that the original shareholders are enriched thereby).

There is also the possibility that entrepreneurs speculate in the prices of the assets they buy, and really make their living that way. Why should not such people be forced to replenish their assets out of taxed profits? If prices were secularly stable and speculators fulfilled in practice only their textbook function of storing *particular* goods whose prices were low and disgorging them when their prices rose, there would be a case for extending to them the proposed tax relief. For their textbook function has great social use. But prices are not secularly stable any more, and in general speculators are assured of a money profit simply by virtue of constant inflation. There is then much to be said for not extending the proposed relief to this class of speculation; but it is to-day only a very small class,¹ and certainly excludes all the long-term assets to whose depreciation inflation sets such problems.

On the whole I do not feel that all the objections anything like outweigh the clear advantage of allowing replacement to take place free of tax.

P. WILES.

¹ Only the class of business speculators in commodities is meant. As to the holders of consumers' assets (particularly houses and cars), it is indeed a question whether some analogous relief should not be offered to them. But this would take us too far afield.

APPENDIX

The actual *rates of tax* imposed on a limited company in the four countries are :

U.K. (1948)	Sweden (1948)
a flat rate of : 50-55 per cent ¹	c. 50 per cent of net profits

In *Belgium* the State taxes according to the scale laid down for private persons, and on top of that the provinces and communes do the same. It is difficult to see any advantage in applying the disincentive of progressive taxation to corporate incomes. The object of progressive taxation should be to equalise wealth among individuals; the equalisation of wealth among corporate persons is irrelevant, even antithetical, to this object. For it penalises all who work for or hold capital in large enterprises as opposed to small—a distinction of no economic or social significance. Besides, such taxation discourages the enlargement of the technical scale of operations and therefore in most cases efficiency. These criticisms appear to be generally accepted in Belgian business circles. In *Switzerland* the system varies with every canton, and is highly complicated, as there are federal, cantonal and communal taxes on both capital and net profit; the tax on net profit is related, in Canton Zürich and for federal purposes, not to its absolute amount but to the *proportion* it bears to share capital. The result of all this is not easy to describe in a few words : in Canton Zürich the total of the three taxes is a much higher proportion of net profit if net profit is small or nil, owing to the capital tax, than in Sweden or U.K. The proportion of tax to net profit falls to a minimum as the latter increases, and after this minimum expands again, ultimately reaching about 50 per cent. Thus in 1947 in Canton Zürich a limited company with share capital and reserves equal to 5,000,000 francs paid taxes as follows :

Net profit	...	...	...	0	250,000	500,000	1,000,000
Communal and cantonal and federal taxes on net profit and capital	...	...	...	28,990	79,930	141,300	499,300

This system would appear to share all the inconveniences of the Belgian system with a very large number of its own. The British tax may thus claim superiority in that it is (a) a flat rate² and (b) chargeable to profit, not capital.

¹ Depending upon the incidence of the profits tax. Note that the British figure excludes rates whereas the Swedish includes local income tax.

² Except that the Treasury has optional powers to subject the excessive retained profits of private companies to surtax.

APPENDIX

United Kingdom Statistics. Derived Series.

	Annual Averages			1949					1950	
	1947	1948	1949	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.
1. Working-class cost of living (1937-8=100) ...										
(a) Food	138 ¹	149	158	160	161	164	164	165	166	167
(b) All Items	161-2 ¹	174	179	180	180	181	181	182	182	182
2. Middle-class cost of living (1938=100)	182 ¹	195	200	201	201	201	202	202	202	203
3. Seasonally corrected Index of Industrial Production (1946=100) ...	114 ³	121	129	131	131	130	132	133	135	...
4. Seasonally corrected Coal Statistics (Annual rates, millions of tons)										
(a) Total Production ...	197	208 ³	215	216	214	214	219	223	229	219
(b) Inland Consumption ...	184	193 ³	195	193	190	189	198	200	196	202
(c) Export and Bunkers ⁴ ...	5	16 ³	19	18	20	21	25	21	21	23
(d) Total Consumption (b+c) ⁵	190	209 ³	214	211	210	210	223	221	217	225
(e) Stock Changes (a-d) ⁶ ...	+ 8	-1	—	-4	+5	+4	-4	+2	+12	-6

¹ June.² April to December only.³ 52 weeks.⁴ Not seasonally corrected.⁵ Annual totals may not be the sums of items, because of rounding.*Details of Derivation*

1. Working-class cost of living. BULLETIN, Vol. 10, p. 140.
2. Middle-class cost of living. BULLETIN, Vol. 11, p. 133.
3. The seasonal correction factors for the Production Index have been recalculated based on the period from April 1947 to December 1949. They are as follows:—

Month	Correction Factor	Month	Correction Factor
January	1.002	July	1.078
February	.964	August	1.097
March	.981	September	.992
April	.989	October	.973
May	.974	November	.951
June	.985	December	1.014

4. Seasonal Correction of Coal Statistics. BULLETIN, Vol. 11, p. 141.

K.M.L.

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